DCS ADAPTER

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FUNCTIONAL REQUIREMENT SPECIFICATION

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Rockwell Automation

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Contents

1 Introduction

This document details the requirements of the functions implemented for the DCS Adapter, an adapter between Rockwell Automation Manufacturing Execution Systems (MES; Level 3 for enterprise integration) and Distributed Control Systems (DCS; Level 2 for enterprise integration).

Each requirement is composed of a name (e.g., Set Order Context) and a unique identifier (e.g., GID-1234567) and is extended with its business attributes (GxP Relevance, Business Impact) and its compliance attribute (21 CFR Part 11 Relevance).

In some cases, additional context information is available, indicated in the document by a frame and a gray background color. This context information is related to the respective requirement, but not part of the formal requirement description.

The revision history lists the changes made to the document with the previous DCS release as comparison baseline. It provides individual tables for "Updated", "Added", and "Deleted" requirements that juxtapose the previous approved version with the new approved version of an item.

Typographical Conventions

This documentation uses typographical conventions to enhance the readability of the information it presents. The following kinds of formatting indicate specific information:

Bold typeface	Designates user interface texts, such as ▪ window and dialog titles ▪ menu functions ▪ panel, tab, and button names ▪ box labels ▪ object properties and their values (e.g., status).

2 Application Programming Interfaces (SR9100+)

Interfaces to a Distributed Control System support the communication between an MES and the connected DCS.

The interface towards the MES is implemented in Java, while the interface to the DCS uses XML-formatted messages.
The messages format is based on S88/S95 standards and B2MML, an XML implementation of the standards.
Typically, a middleware component, e.g. EIHub or Apache Camel, is used to connect the DCS Adapter to the specific Distributed Control System and technology.

For further details on the architecture, Java API, or XML message formats, please see "Technical Manual DCS Adapter" [A1] (page 9).

2.1 GID-2666174 Create a DCS Batch (SR9100.1)

An MES can request the creation of a batch on the DCS.

- The request contains the desired DCS batch ID.
- In the reply, the DCS indicates whether the batch creation was successful or an error has occurred and returns the internal unique batch ID of the created batch.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.2 GID-2666175 Get Values from a DCS Batch (SR9100.2)

An MES can request to get values from a batch on the DCS.

- The request contains a list of the IDs and paths of the value to be used.
- In the reply, for each ID and path, the DCS returns the value if it is already available or an error message if the values could not be used successfully.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.3 GID-2666176 Get GxP-relevant Alarms from the DCS (SR9100.3)

An MES can request to get the GxP-relevant alarms from the DCS.
The alarms can be related to a batch, a unit, and/or a particular timeframe depending on the request parameters.

- The request contains the query parameters that restrict the list of alarms.
- In the reply, the DCS returns the list of alarms matching the query or an error message if the alarm could not be used successfully.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.4 GID-2666177 Set Order Context (SR9100.4)

An MES can request to set an order context on the DCS.

- The request contains the order-related data including the list of material parameters.
- In the reply, the DCS indicates whether the order context could be set successfully or an error has occurred.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.5 GID-2666178 Receive Consumed Material (SR9100.5)

DCS can notify an MES that material has been consumed.

- The request contains information about the consumed material.
- In the reply, the MES indicates whether the **consumed material** event was processed successfully or an error has occurred.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.6 GID-2666179 Receive Produced Material (SR9100.6)

DCS can notify an MES that material has been produced.

- The request contains information about the produced material.
- In the reply, the MES indicates whether the **produced material** event was processed successfully or an error has occurred.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.7 GID-2666180 Get Information of an MES Batch (SR9100.7)

DCS can request to get information of a batch on an MES.

- The request contains the batch ID and material of the batch for which information is required.
- In the reply, the MES returns all relevant batch information.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.8 GID-2666181 Receive DCS Event (SR9100.8)

DCS can send a message event to the MES for synchronization purposes (e.g. to notify an MES that a subsequent process can be started).
The interface supports the asynchronous use case in which it is not necessary that the receiver is already running when the request is sent.
Default is the synchronous use case.

- The request contains the identifier of the message, the message itself, the batch ID, and the material of the affected batch.
- In the reply, the MES indicates whether the message event was processed successfully or an error has occurred.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.9 GID-2666182 Set Parameter Values (SR9100.9)

An MES can request to set a set of dynamically configurable parameter values to the DCS.

- The request contains information to address the automation system, a list of the IDs, values, and categories of the values to be set.
- In the reply, the DCS indicates whether the values could be set successfully or an error has occurred.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

2.10 GID-2666183 Get Parameter Values (SR9100.10)

An MES can request to get a set of dynamically configurable parameter values from the DCS.

- The request contains information to address the automation system, a list of the IDs and paths of the value to be used.
- In the reply, for each ID and path, the DCS returns the value if it is already available or an error message if the values could not be used successfully.

Attribute	Value
MES-Business: GxP relevance	Yes
MES-Business: Business Impact	High
MES-Compliance: 21 CFR Part 11 relevance	No

3 Integration Implementations

The following integration implementations are available for Rockwell Automation products:

- PharmaSuite MES integration points
  For the PharmaSuite MES solution, deployable integration components are available.
  For more information, please refer to PharmaSuite and its "Functional Requirement Specification DCS Phases" [A2] (GID-2430134).
- PlantPAx DCS integration Points
  For the PlantPAx DCS integration, please refer to the solution provided by your Rockwell Automation contact.

4 Reference Documents

The following documents are available from the Rockwell Automation Download Site.

No.	Document Title	Part Number
A1	Technical Guide DCS Adapter	DCTMAD-GR004A-EN-E
A2	FT PharmaSuite Functional Requirement Specification DCS Phases	PSFRSDC-RM004A-EN-E

To access the Rockwell Automation Download Site, you need to acquire a user account from Rockwell Automation Sales or Support.

5 Document Information

The document information covers various data related to the document.

5.1 Approval

This document has been approved electronically via the Rockwell Automation Document Management System (DMS). The required approvers of this document include the following:

Name	Role
Norbert Ern	Product Owner
Sandesh Ghule	Technical Lead
Ignaz Wangler	Test Lead

5.2 Version Information

Object	Version
DCS Adapter	11.00.00
Functional Requirement Specification	1.1

Appendix A - Revision History

Updated Requirements

None

Added Requirements

None

Deleted Requirements

None

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